REMARKS

Applicant has thoroughly considered the Examiner's remarks in the October 31, 2003 action. By this Amendment B, claims 1 and 7 have been amended and claim 2 has been canceled. Claims 1 and 3-7 are now presented in the application for further consideration. Applicant respectfully requests allowance of the application in light of the amendments and following remarks.

Rejection Under Second Paragraph of 35 U.S.C. § 112

In response to the rejection of claims 1-6 under the second paragraph of 35 U.S.C. §112, applicant directs the Examiner's attention to Amendment A filed August 28, 2003 in which claims 1, 4, and 5 were amended in compliance with section 112. Applicant has further amended claims 1 and 7 by this Amendment B to more clearly set forth the invention. Applicant submits the pending claims are in compliance with the requirements of 35 U.S.C. §112 and the rejection should be withdrawn.

Rejection Under 35 U.S.C. §102

Claims 1-3, 5, and 6 stand rejected under 35 U.S.C. §102(b) as being anticipated by U.S. Patent No. 5,884,391 to McGuire et al. Claims 1-6 stand rejected under 35 U.S.C. §102(e) as being anticipated by U.S. Patent No. 6,242,997 to Barrett et al. Applicant submits, however, that the cited references fail to teach each and every aspect of the claimed invention.

McGuire discloses a process for manufacturing an electrical device comprising a PTC element. In the process of McGuire, a plurality of electrically non-conductive gaps are formed in first and second electrodes of a PTC sheet, and then electrodeplated to form end terminations. **Thereafter, the PTC sheet is cut into PTC devices. Thus, each end termination only has three conductive surfaces (i.e., the top, the bottom, and right surfaces).** In other words, the two cut surfaces of each end termination are not electroplated. Referring to the schematic figure

(see enclosure), which is an enlarged version of Fig. 9G of McGuire, a conductive layer 150 only has three conductive surfaces, i.e., the top surface a, the bottom surface c and the right surface b, wherein the other cut surfaces, namely front surface e and back surface f do not have conductive layers formed thereon.

In the present invention, a positive temperature coefficient (PTC) sheet is cut into a plurality of strips. Four surfaces (e.g., the top, bottom, front, and back surfaces) of each strip are coated by an insulating layer to protect the surfaces from being electroplated, so that short circuit between the metal foils and the PTC material does not occur when electroplating is performed. Then, the PTC sheet is cut into chips. Next, each chip is electroplated or dipped to form two terminal electrodes (218) on both ends of the chip, wherein each terminal electrode (218) has five conductive surfaces (i.e., the top, bottom, right, back, and front surfaces) (referring, for example, to Figs. 13A and 13B of the present application).

The process of the subject invention is different from that of McGuire, wherein the subject invention uses Barrel plating step **after** a chip forming step; and McGuire uses Suspension plating **before** chip forming step. Accordingly, the sequence for the process of the subject invention is different from that of McGuire. In particular, McGuire does not disclose the technical feature of the present invention that each terminal electrode (218) has five conductive surfaces. McGuire fails to teach each and every element of claim 1.

Referring to Fig. 11 of the Barrett patent, **each of the terminal electrodes (66), (68) only has three conductive surfaces** (i.e., the top, bottom and right surfaces). In other words, the other two surfaces corresponding to surfaces e and f shown in the enclosure are not covered with conductive layers. Similarly, **Barrett does not disclose the technical feature of the present invention that each terminal electrode (218) has five conductive surfaces.** Therefore, Barrett also fails to teach each and every element of claim 1.

In addition, the surfaces of the structure of the subject invention are coated by an insulating layer so that the PPTC material are insulated from the outside contaminant, and thus the structure of the subject invention has better water-resistant and oil-resistant properties when compared to the product manufactured by the process of the cited art. Moreover, the structure of the subject invention has five conductive surfaces which increase the contact area and thus the

solderability thereof is better than that of devices disclosed in McGuire and Barrett. Therefore, claim 1 is believed to be allowable over the cited reference.

Claims 3-6 depend from claim 1, and are believed to be allowable for at least the same reasons as the claim from which they depend.

Rejection Under 35 U.S.C. §103

Claims 6 and 7 stand rejected under 35 U.S.C. §103(a) as being unpatentable over McGuire or Barrett in view of U.S. Patent No. 4,993,142 to Burke et al. Notwithstanding the Examiner's statements, applicant hereby submits that the combination of Burke with McGuire or Barrett fails to teach or suggest each and every element of the claimed invention In particular, the Burke patent fails to remedy the deficiencies of the McGuire and Barrett patents by failing to teach or suggest that each terminal electrode (218) has five conductive surfaces as recited in independent claim 1. Therefore, claim 1 is believed to be allowable over the cited references.

Moreover, the Burke patent relates to a process for a negative temperature coefficient (NTC) material, which is opposite to the Positive Temperature Coefficient (PTC) material of the subject invention. Burke and the subject invention have different electrodes in structure for the following reasons:

(i) For the NTC material of Burke, its conductivity is positively proportional to temperature. Moreover, the **ceramic** material serving as NTC material has a poor conductivity at the room temperature. For the PTC material (such as **polymer conductive** material) of the subject invention, its conductivity is inversely proportional to temperature. The polymer conductive material of the subject invention has a better conductivity at the room temperature.

(ii) The low dielectric insulating material of claim 3, $A1_2O_3$ or ceramic oxide, has a low sintering temperature and acid resistance. The insulating material of the subject invention, a polymer material, can prevent the parts of metal foils and PTC material covered by the insulating material from being electroplated, so that short circuit between the metal foils and the PTC material does not occur when electroplating is performed.

For these reasons, applicant submits that the cited art does not show the patentable combination of claim 1. In addition, claims 6 and 7, which depend from claim 1, are believed to be allowable for at least the same reasons as claim 1.

Summary and Concluding Remarks

The device of the subject invention is manufactured according to a passive device process, rather than PCT process. In the subject invention, the step of forming plural chips is performed before electrodeplating each chip with an insulating material. The top, bottom, front, back, and right surfaces of each chip are covered with an insulating layer, so that the polymer conductive material covered by the insulating layer can be prevented from a short circuit. In the cited art, electrodeplating is performed before the chip forming step. Therefore, each of these prior art chips does not have an insulating layer for protection.

As stated in the present application, the chip forming step is performed before the electroplating step, while in the cited art, electrodeplating is performed before chip forming. Therefore, each terminal electrode of the subject invention has five conductive surfaces, having a different structure from that of the structures taught by the references.

In view of the foregoing, applicant respectfully submits that claims 1 and 3-7 are allowable and that the subject application is now in condition for allowance.

The Commissioner is hereby authorized to charge any fees that may be required during the entire pendency of this application to Deposit Account No. 19-1345.

Respectfully submitted,

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